REMARKS

Claims 1-2 and 4-20 are active in the present application. Claims 1, 2, 4-6 and 18 are currently under active prosecution. Claim 3 has been canceled. Claim 1 has been amended to incorporate the limitations of Claim 3. Claim 1 has been further amended to require that Y in the formula MO_XF_Y is greater than or equal to 1. Support for the amendment is found in the specification on page 20, lines 2-3 where a number of metal oxide fluoride species are disclosed. The specification has been amended on pages 8-17 and 37 to remove references to the claim numbers and to correct typographical errors. No new matter is believed to have been added by this amendment.

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Jackson for the helpful and courteous discussion of October 22, 2002. During the discussion Applicant's U.S. representative presented arguments that the rejection in view of Jansen (U.S. 5,496,583) should be withdrawn.

The Jansen patent discloses the formation of HF by the reaction of a fluorocarbon with oxygen (column 3, lines 6-14). The chemical formula presented in column 3, line 13

$$HCF_3 + 0.5\ O_2 + H_2O \rightarrow 3HF + CO_2$$

shows that CO_2 is formed in the Jansen process. As is disclosed in column 2, lines 23-24, the prior art invention is "accomplished by passing a mixture of a fluorocarbon and an excess of air into a reactor." As demonstrated by the chemical formula in column 3, line 13 of Jansen this necessarily results in the formation of CO_2 by reaction of the fluorocarbon with oxygen.

As stated in the present specification on page 3, lines 6-17 a MgO film degenerates when reacted with CO_2. Applicants submit that the method of Jansen would degenerate the film body that the presently claimed protecting film protects since CO_2 is formed (page 6,

lines 9-21). The disclosure of the formation of CO_2 in the Jansen patent is directly contradictory to the presently claimed invention wherein a protecting film is present on a film body and protects the film body from degeneration by contact with gases such as CO_2. Applicants respectfully request the withdrawal of the rejections in view of the Jansen patent.

Claim 1 has been amended to incorporate the limitations of Claim 3. Amended Claim 1 is drawn to a FPD protecting film that includes a film body on the surface of a substrate and a fluoride layer on the surface of the film body. The fluoride layer is of formula MO_XF_Y. The fluoride layer contains fluorine since Y must be from 4 to 1. The fluoride layer must also contain oxygen since X must be greater than 0.

The Konishi (U.S. 5,891,531) patent describes a process where a gaseous metal organic is reacted with a fluoride source to provide a metal fluoride film. The Konishi thin film of a fluoride contains very little impurities such as carbon and oxygen (column 5, lines 8-10). The thin films exemplified in column 10, lines 18-26 do not contain oxygen. Konishi does not suggest or disclose a MO_XF_Y film as presently claimed. In fact, Konishi discloses that it is an advantage of the prior art invention that the thin film of fluoride contains "very little impurities such as carbon, oxygen, and organic substances" (column 10, lines 27-30). Applicants submit the Konishi patent does not disclose or suggest the MO_XF_Y metal-oxy fluoride films presently claimed and respectfully request the withdrawal of the rejections in view of the Konishi reference.

Present Claim 1 limits Y in the formula MO_XF_Y to values greater than or equal to 1 and less than or equal to 4. JP 07-201280 was cited by the Examiner in the Office Action of August 28, 2002 to evidence that the presently claimed invention is anticipated. A material of the formula MO_XF_Y where $0 < X < 2$ and $1 \leq Y \leq 4$ is not anticipate by a prior art material having the formula $MgO_{1-X-Y}F_Y$ where $0 < X < 1$, $0 < Y < 1$. Applicants submit the presently

claimed invention is not anticipated or obvious in view of a fluoride film wherein the fluorine is present in amounts less than unity. Applicants respectfully request the withdrawal of the rejections in view of JP 07-201280 (English machine translation).

The Office provisionally rejected the claims under non-statutory double patenting in view of copending U.S. Application Serial No. 09/901,908. Claim 1 of 09/901,908 is drawn to a "vapor deposited material for FPD protective film." The vapor deposited material is a material that is used for, for example, preparing an FPD (flat patent display). The presently claimed FPD protecting film is present on a film body which is present on a substrate. The structure and function of the presently claimed FPD protecting film and the vapor deposited material for FPD protective film of 09/901,908 are different. The claimed film body is not obvious in view of the vapor deposited material of 09/901,908.

The FPD protective film of original Claim 9 of 09/901,908 includes a fluoride layer that is present on the peripheral side surfaces and top surfaces of a film body that is an aggregate of columnar crystallites. The presently claimed invention does not require a film body that is an aggregate of columnar crystallites and does not require the presence of the film layer on the periphery and top of columnar crystallites. Applicants submit that the presently claimed invention is not obvious in view of 09/901,908 in view of the structural differences between the film bodies.

The double patenting rejection is not supportable in view of the differences between the invention claimed in 09/901,908 and the presently claimed invention. Applicants respectfully request the withdrawal of the rejection under double patenting.

Applicants respectfully request the withdrawal of the rejections and the passage of all now pending claims to Issue. Applicants submit the amendment to the claims places all claims in condition for allowance.

Respectfully submitted,

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Amendment Filed: **Herewith**

IN THE SPECIFICATION

Please replace the paragraph on page 8, lines 1-7 with the following paragraph.

In accordance with [Claim 1 of] the present invention, as shown in Figs. 1 and 2, a FPD protecting film comprises a film body 14a formed on a substrate 13 and made of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides; and a fluoride layer 14b formed on the surface of the film body 14a.

Please replace the paragraph on page 8, lines 8-16 with the following paragraph.

In the FPD protecting film [in accordance with Claim 1,] the surface of the film body 14a is coated with the fluoride layer 14b, and thus MgO or the like in the film body 14a little reacts with CO_2 gas and H_2O gas in air even when the protecting film 14 is exposed to air for a long time in the process for manufacturing FPD 10 (refer to Fig. 2). As a result, MgO or the like in the film body 14a is little degenerated to $MgCO_3$ and $Mg(OH)_2$ which possibly deteriorate the function of the FPD 10.

Please replace the paragraph on page 8, line 3 from the bottom through page 9, line 7 with the following paragraph.

In accordance with [Claim 2 of] the present invention, as shown in Figs. 3 and 4, a FPD protecting film comprises a film body 34a formed on a substrate 13 and made of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, wherein the film body [34 a] 34a is formed by using a fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides.

Please replace the paragraph on page 9, lines 8-20 with the following paragraph.

In the FPD protecting film [in accordance with Claim 2,] the surfaces of MgO powder particles or the like are coated with fluoride layers, and thus MgO or the like in the film body 34a little reacts with CO_2 gas and H_2O gas in air even when the protecting film 34 is exposed to air in the manufacturing process (refer to Fig. 4). As a result, MgO or the like in the film body 34a is little degenerated to $MgCO_3$, $Mg(OH)_2$, etc. having the probability of deteriorating the function of FPD 10. Since the fluoride layers coated on the surfaces of MgO powder or the like are very thin, the mechanical characteristics of the MgO powder or the like are substantially the same as a MgO powder or the like with no fluoride layer coated on the surfaces thereof.

Please replace the paragraph on page 10, lines 10-17 with the following paragraph.

In accordance with [Claim 7 of] the present invention, a method of producing a FPD protecting film comprises forming a film body 14a on a substrate 13 by using any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides; and treating the surface of the film body with a

gaseous fluorinating agent to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

Please replace the paragraph on page 10, lines 18-24 with the following paragraph.

In the method of producing a FPD protecting film [in accordance with Claim 7], MgO or the like in the film body 14a is little degenerated to $MgCO_3$ and $Mg(OH)_2$ which are harmful to the function of the FPD 10 (refer to Fig. 2), thereby shortening the time of the subsequent degassing step for removing $MgCO_3$ and $Mg(OH)_2$ or omitting the subsequent degassing step.

Please replace the paragraph on page 10, last line through page 11, line 7 with the following paragraph.

In accordance with [Claim 8 of] the present invention, [the] a method [according to Claim 7] comprises forming a film body 14a on a substrate 13 in a vacuum, and treating the surface of the film body 14a with a gaseous fluorinating agent in a vacuum or an inert gas atmosphere without exposing the film body 14a to air to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

Please replace the paragraph on page 11, line 8-15 with the following paragraph.

In the method of producing a FPD protecting film [in accordance with Claim 8], after the film body 14a is formed on the surface of the substrate 13, the film body 14a is not exposed to air before the fluoride layer 14b is formed on the surface of the film body 14a, thereby preventing or suppressing the production of carbonate ($MgCO_3$, or the like[.]) and

hydroxide ($Mg(OH)_2$, or the like) of MgO, which are harmful to the FPD, on the surface of the film body 14a.

Please replace the paragraph on page 11, lines 16-23 with the following paragraph.

In accordance with [Claim 9 of] the present invention, [the] a method [according to Claim 7] comprises forming a film body 14a on a substrate 13 in a vacuum, burning the film body 14a in air after exposing the film body 14a to air to activate the film body 14a, and treating the surface of the film body 14a with a gaseous fluorinating agent to form a fluoride layer 14b on the surface of the film body 14a, as shown in Figs. 1 and 2.

Please replace the paragraph on page 11, line 2 from the bottom through page 12, line 12 with the following paragraph.

In the method of producing a FPD protecting film [in accordance with Claim 9], after the film body 14a is formed on the surface of the substrate 13, the film body 14a is exposed to air and burned in air to be activated. Therefore, even when carbonate ($MgCO_3$, or the like) and hydroxide ($Mg(OH)_2$, or the like) of MgO, which are harmful to the FPD, are formed on the surface of the film body 14a, the carbonate ($MgCO_3$, or the like) and hydroxide ($Mg(OH)_2$, or the like) of MgO are removed as CO_2, and H_2O by burning in air. In this [sate] state, the fluoride layer 14b is formed on the surface of the film body 14a to protect the surface of the film body 14a by the fluoride layer 14b, thereby preventing and suppressing the formation of carbonate ($MgCO_3$, or the like) and hydroxide ($Mg(OH)_2$, or the like) of MgO.

Please replace the paragraph on page 12, lines 13-17 with the following paragraph.

In accordance with [Claim 10 of] the present invention, [the] a method [according to Claim 8 or 9] further comprises activating the film body 14a before, during or after the substrate 13 on which the film body 14a and the fluoride layer 14b are formed is assembled into a panel.

Please replace the paragraph on page 12, lines 18-25 with the following paragraph.

In the method of producing a FPD protecting film [according to Claim 10], since the film body 14a is activated by burning after the fluoride layer 14b is formed on the surface of the film body 14a, even when hydroxide ($Mg(OH)_2$, or the like) of MgO or the like is formed a little on the film body 14a, the hydroxide can be removed as H_2O, thereby decreasing the rate of recontamination of the film body 14a with atmospheric moisture.

Please replace the paragraph on page 13, lines 1-16 with the following paragraph.

In accordance with [Claim 11 of] the present invention, a method of producing a FPD protecting film comprises treating, with a gaseous fluorinating agent, the surfaces of a powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides to coat fluoride layers on the powder surfaces of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides; mixing a binder, a solvent and the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides to prepare paste or a dispersion for a film; and forming a film body 34a on the surface of a substrate 13 by using the paste or dispersion for a film, as shown in Figs. 3 and 4.

Please replace the paragraph on page 13, lines 17-24 with the following paragraph.

In the method of producing a FPD protecting film [according to Claim 11], since MgO or the like in the film body 34a is little degenerated to $MgCO_3$, $Mg(OH)_2$, etc. harmful to the function of the FPD 10 (refer to Fig. 4), it is possible to shorten the time of the subsequent degassing step for removing the $MgCO_3$, $Mg(OH)_2$, etc., or omitting the subsequent degassing step, thereby decreasing the manufacturing cost of the FPD 10.

Please replace the paragraph on page 13, last line through page 14, line 8 with the following paragraph.

In the method according to [any one of Claims 7 to 11 of] the present invention, the film body 14a made of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides, or the [power] powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides is preferably surface-treated with the gaseous fluorinating agent under pressure of 1 to 760 Torr.

Please replace the paragraph on page 14, lines 9-12 with the following paragraph.

In the method [according to any one of Claims 7 to 11], as the gaseous fluorinating agent, any one of fluorine gas, hydrogen fluoride gas, BF_3, SbF_5, and SF_4, particularly fluorine gas or hydrogen fluoride gas, is preferably used.

Please replace the paragraph on page 14, lines 13-17 with the following paragraph.

[In accordance with Claim 14, a] A powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides

and rare earth oxides is coated with a fluoride layer in order to form a FPD protecting film 34 [according to Claim 2].

Please replace the paragraph on page 14, lines 18-20 with the following paragraph.

[In accordance with Claim 15, the] The thickness of the fluoride layer coated on the powder [according to Claim 14] is preferably 0.1 to 1000 nm.

Please replace the paragraph on page 14, line 19 through page 15, line 1 with the following paragraph.

[In accordance with Claim 16, the] The paste for a film is prepared by mixing a binder, a solvent, and the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides [according to Claim 14 or 15].

Please replace the paragraph on page 15, lines 2-7 with the following paragraph.

[In accordance with Claim 17, the] The dispersion for a film is prepared by mixing a binder, a solvent, and the fluoride layer-coated powder of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, and compound oxides of alkali earth oxides and rare earth oxides [according to Claim 14 or 15].

Please replace the paragraph on page 15, lines 8-10 with the following paragraph.

The use of the paste or dispersion for a film containing the fluoride layer-coated powder permits easy formation of a film body [according to Claim 2].

Please replace the paragraph on page 15, lines 11-12 with the following paragraph.

[In accordance with Claim 18 of the present invention,] The FPD uses a protecting film [according to any one of Claims 1 to 6].

Please replace the paragraph on page 15, lines 15-17 with the following paragraph.

The FPD [according to Claim 18] of the present invention permits a significant decrease in number of steps for manufacturing FPD, and manufacture at low cost.

Please replace the paragraph on page 15, line 18 through page 16, line 2 with the following paragraph.

In accordance with [Claim 19 of] the present invention, a method of producing a FPD protecting film comprises forming, on the surface of a substrate 13, a protecting film 54 made of any one of alkali earth metal oxides, alkali earth metal compound oxides, rare earth metal oxides, and compound oxides of alkali earth metals and rare earth metals treating the surface of the protecting film 54 with a gaseous fluorinating agent to form a fluoride layer 55 on the surface of the protecting film 54; and then removing the fluoride layer 55 after FPD is assembled by using the substrate 13, as shown in Fig. 5.

Please replace the paragraph on page 16, lines 3-20 with the following paragraph.

In the method of producing a FPD protecting film [according to Claim 19], the protecting film 54 is reacted directly with the gaseous fluorinating agent to form the fluoride layer 55 on the surface of the protecting film 54, thereby coating the surface of the protecting film 54 with the fluoride layer 55. Therefore, even when the protecting film 54 is exposed to air for a long time during the process for manufacturing the FPD 10, the protecting film 54

little reacts with CO_2 gas and water vapor in air. As a result, the protecting film 54 is little degenerated to a carbonate, a hydroxide, etc., of an alkali earth metal oxide or the like, which have the probability of deteriorating the function of the FPD 10. On the other hand, it is possible to prevent the occurrence of cracking in the fluoride layer 55 and separation thereof because of good matching between the fluoride layer 55 and the protecting film 54, thereby improving the degeneration protecting effect of the protecting film 54.

Please replace the paragraph on page 17, lines 10-13 with the following paragraph.

In accordance with [Claim 24 of] the present invention, the FPD protecting film 54 is produced [by this production method according to any one of Claims 19 to 23,] as shown in Fig. 5.

Please replace the paragraph on page 17, lines 14-16 with the following paragraph.

[In accordance with Claim 25 of the present invention,] The FPD 10 uses the protecting film 54 [according to Claim 24,] as shown in Fig. 5(d).

Please replace the paragraph on page 17, lines 17-20 with the following paragraph.

In the FPD protecting film 54 [according to Claim 24 or 25], the fluoride layer 55 is removed after assembly of the FPD 10, thereby improving discharge characteristics of the FPD 10.

Please replace the paragraph on page 37, line 14 through page 38, line 9 with the following paragraph.

Next, sintered pellets of an alkali earth metal oxide or the like (for example, MgO), which has a purity of 99.5% or more, are deposited by vaporization such as electron beam evaporation or the like to cover the surface of the transparent dielectric layer 17 of the glass substrate 13, to form the protecting film 54 (Fig. 5(a)). Deposition conditions of the protecting film 54 preferably include an acceleration voltage of 5 to 30 kV, a deposition pressure of 0.1×10^{-2} to 10×10^{-2} Pa, and a deposition distance of 100 to 1000 nm. The front glass substrate 13 is further maintained in an atmosphere of a gaseous fluorinating agent (temperature 10 to 100°C) for 0.1 to 120 minutes to modify the surface of the protecting film 54, to form the fluoride, layer 55 on the surface of the protecting film 54 (Fig. 5(b). The pressure of the gaseous fluorinating agent is preferably set in the range of 1 to 760 Torr, more preferably in the range of 10 to 300 Torr. The reason for limiting the pressure of the gaseous fluorinating agent in the range of 1 to 760 Torr is that control of the extent of reaction, i.e., control of the thickness of the fluoride layer, is facilitated.

IN THE CLAIMS

--1. (Amended) A FPD protecting film comprising:

a film body [composed] comprising of any one of MgO, CaO, SrO, BaO, alkali earth compound oxides, rare earth oxides, [and] or compound oxides of alkali earth oxides and rare earth oxides, [which is formed] wherein the film body is present on the surface of a substrate; and

a fluoride layer present [formed] on the surface of the film body, wherein the fluoride layer is represented by the formula

$$MO_XF_Y,$$

wherein M is Mg, Ca, Sr, Ba, an alkali earth complex metal, a rare earth metal, or a complex metal of an alkali earth metal and rare earth metal, $0 < X < 2$ and $1 \leq Y \leq 4$.

4. (Amended) [A] The FPD protecting film according to Claim 1 [or 2], wherein the fluoride layer is obtained by reaction of a gaseous fluorinating agent with any one selected from the group consisting of MgO, CaO, SrO, BaO, an alkali earth compound [oxides] oxide, a rare earth [oxides] oxide, and a compound [oxides] oxide of alkali earth oxides and rare earth oxides.

5. (Amended) [A] The FPD protecting film according to Claim 4, wherein the gaseous fluorinating agent comprises a fluorine gas, a hydrogen fluoride gas, BF_3, SbF_5 or SF_4.--